

# Treasure Hunt: Higher, Faster, Farther

## Gathering and Using Data about the Speed and Altitude of Aircraft

### Grades 7 - 12

## Introduction



On December 17, 1903 Wilbur and Orville Wright finally achieved victory as their airplane made its first flight. The feat was the result of many years of investigations, careful record keeping, and failures. Go to this website to find a copy of the Wright brothers' application for a patent for their airplane. Notice the careful measurements.

<http://invention.psychology.msstate.edu/i/Wrights/WrightUSPatent/WrightPatent.html>

You can read about the measurements Orville Wright recorded in his diary about the flight on December 17, 1903 at

<http://www.first-to-fly.com/History/Wright%20Story/OW121703.htm>

## Instructions

1) During this activity you will record the speed of airplanes and the year it occurred. You will find this data on various web sites. The year and the speed of the airplanes will be your data. You will graph the data, analyze the data, and interpret the data.

Go to this website to discover how fast the Wright brother flew on their first flight.

[http://www.1903to2003.gov/essay/Wright\\_Bros/First\\_Powered\\_Flight/WR6.htm](http://www.1903to2003.gov/essay/Wright_Bros/First_Powered_Flight/WR6.htm)

The information is recorded in feet and seconds. Use the data from Wilbur's fourth flight of the day. For this speed to be consistent with the remaining data change the speed to miles per hour. (Round off the nearest mile.)

Use this information to begin a table similar to the one below.

<u>Year</u>	<u>Speed of Aircraft</u>
1903	
1910	
1922	
1936	
1940	
1947	
1953	
1965	
1976	



Search [www.first-to-fly.com/History/Just%20the%20Facts/modelr.htm](http://www.first-to-fly.com/History/Just%20the%20Facts/modelr.htm) to learn how fast planes were flying by 1910; average the speeds and enter the average in your table. Go to [www.aerofiles.com/chrono.html](http://www.aerofiles.com/chrono.html) to search for speed records to fill in the rest of the table.

Plot the data you have gathered on a graph. Put the years across the horizontal axis (x-axis) and the speeds along the vertical axis (y-axis). Label the graph.

2) During this activity you will record the altitude (height) of airplanes and the year it occurred. You will find this data on various web sites. The year and the altitude of the airplanes will be your data. You will graph the data, analyze the data, and interpret the data.

Investigate this site to find a photo of the Wright Brothers first flight. It is easy to observe that the plane flew close to the ground.

<http://wright.grc.nasa.gov/WWW/Wright/airplane/air1903.html>

Orville and Wilbur had solved many problems of their first flight through continued experiments and careful recording of data. Scroll through the information at this site to find how high their plane was flying by 1905.

<http://wright.grc.nasa.gov/WWW/Wright/airplane/powered.html>

Use this information to begin a table similar to the one below.

<u>Year</u>	<u>Altitude of Aircraft</u>
1905	
1910	
1918	
1924	
1930	
1965	



Search [www.aerofiles.com/chrono.html](http://www.aerofiles.com/chrono.html) for altitude records to fill in the rest of the table.

Plot the data you have gathered on a graph. Put the years across the horizontal

## Questions

If you were to use the data points to sketch a smooth curve what name would you give the type of curve.

If you have a graphing calculator, enter the data and use the calculator to find the algebraic equation that describes the data.

Write a short paragraph about the results of analyzing your data. Why do you think the speeds/altitudes increased so quickly? Do you think airplane speeds/altitudes will continue to increase using the equation you found into the next century? (Find information about how fast new planes will fly by reading information at this website [www.dfrc.nasa.gov/Projects/current.html](http://www.dfrc.nasa.gov/Projects/current.html) . Find information about how high new planes will fly by reading information at this website [http://www.dfrc.nasa.gov/organizations/oc\\_fabrication/calgroup.html](http://www.dfrc.nasa.gov/organizations/oc_fabrication/calgroup.html))

## Notes to the Educator/Parent

The intent of this lesson is to use students' interest in the Centennial of Flight celebration to gather, record, and analyze data. Because the data increases exponentially Algebra I and Algebra II students will need a graphing calculator to find the equation that best "fits" the smooth curve. They will need to know that there are 3600 seconds in an hour and 5280 feet in a mile to change feet per second to miles per hour.

## Standards (NCTM, 2000)

### Algebra Standard for Grades 7 - 12

Understand patterns, relations, and functions

Represent and analyze mathematical situations and structures using algebraic symbols

Use mathematical models to represent and understand quantitative relationships

Analyze change in various contexts